News release

Man-made aerosols influence climate change

21 December 2005

New observations show that man-made aerosols may be having a greater direct effect on our climate than previously thought.

Scientists at the Met Office's Hadley Centre have observed the direct effect of man-made aerosols on the climate system and say that climate predictions may have underestimated global warming by not giving these influences full consideration.

Small airborne particles - or aerosols - emitted into the atmosphere by human activities have a direct cooling effect on the Earth's climate through the scattering and absorption of the sun's incoming radiation. It is known that this cooling effect has offset 20th century global warming to some degree and without this, temperatures would have risen at a faster rate.

Using extensive observations from aircraft, ground- and satellite-based instruments, the study - led by Nicolas Bellouin - has shown that the direct effect of man-made aerosols on the climate may be greater than previous estimates.

The findings, to be published this week in the scientific journal *Nature*, are the first to separate man-made and natural aerosols on a global scale using observations. To date, predictions of global warming have been based on uncertain estimates of man-made aerosols. Bellouin says: "Being able to separate the contribution from natural aerosols using observations is needed in order to estimate the cooling effect of man-made aerosols. We can show that these estimates are less uncertain than those from computer models."

Assessing the implications for man-made global warming Bellouin continues: "If computer models are indeed underestimating the strength of the cooling by man-made aerosols, they may also underestimate climate warming. Of course, a reduction in aerosols will lead to an increase in global warming but is necessary to counter local pollution."

More about the Hadley Centre

For further information:
Met Office Press Office +44 (0)1392 886655
E-mail: pressoffice@metoffice.gov.uk

Met Office Customer Centre 0870 900 0100
If you're outside the UK +44 (0)1392 885680

Notes:

The research is to be published in *Nature* on Thursday 22 December 2005.

Aerosols also have an indirect effect on climate through their interaction with clouds, which is not included in this study. This additional effect complicates the relationship between aerosol cooling and future climate warming.

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